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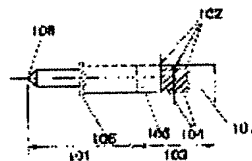
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(54) 【発明の名称】 超音波刻印ペン



【0001】

【発明の属する技術分野】

本発明は、金属等の堅牢物表面に、文字やマーキングを形成する刻印ペンに関し、特に超音波振動を利用して刻印を施す超音波刻印ペンに関するものである。

【0002】

【従来の技術】

従来、この種の堅牢物表面に文字やマーキングを刻印する装置としては、モーターを高速回転させて回転軸に連結した先端回転部分で被刻印物表面を研削し刻印する電動モータペンや、高電圧の放電現象を利用し金属表面を溶融させ刻印する電気ペンなどが一般的である。

【0003】

これらの装置において、電動モータペンは短時間で深い刻印を行う為には先端部を被刻印物表面に強力に圧接する加圧力が必要である。また、電気ペンは、ペン先端部と被刻印物の距離の変化によって、放電が不安定になり、明瞭な刻印が得られないという問題点や被刻印物が金属の導電性物質に限定される。

【0004】

圧電振動子単体での超音波振動を利用した堅牢物表面への刻印については、振動先端部の磨耗量が大きく、長時間、同一の刻印能力を保持することが困難である。

【0005】

また、圧電振動子の超音波振動を利用して刻印を行う場合、振動先端部の振動振幅は5ミクロンから25ミクロン程度必要である。圧電振動子単体で前記振動振幅量を得ることが困難である場合は、通常コーンと呼ばれる変位量拡大治具と圧電振動子を組み合わせた圧電振動複合体として、振動先端部の振動振幅を拡大する方法が用いられる。この際、前記コーンの材料としては、弾性係数の大きなステンレス、或いはチタン合金、鈦系の材料等が通常用いられている。

【0006】

しかしながら、前述のコーン用材料は、被刻印物の硬さより十分大きな硬さを有する材料でなければ、コーン自体の磨耗が大きくなり、長時間の使用に耐えられない。

【0007】

【発明が解決しようとする課題】

そこで、本発明は、前述の問題点を解決するためになされたもので、刻印時、大きな加圧力を必要とせず、被刻印物の電気伝導性に関係無く、長時間の使用に際しても刻印性能の劣化の少ない超音波刻印ペンを提供することを目的とする。

【0008】

【課題を解決するための手段】

本発明によれば、圧電振動子単体或いは圧電振動子と変位量拡大コーンを組み合わせた圧電振動複合体を共振周波数近傍で駆動し堅牢物表面に刻印する超音波刻印ペンにおいて、振動先端部の面積が 1mm^2 以下であることを特徴とする超音波刻印ペンが得られる。

【0009】

また、本発明によれば、炭素鋼に焼き入れを行った振動先端部や、ダイヤモンド粉末の電着を施した振動先端部を有する超音波刻印ペンが得られる。

【0010】

振動先端部の面積が 1mm^2 より大きくなると、刻印やマーキングの線の太さが 1.2mm より太くなり、精細な文字やマーキングを表示できなくなるので、振動先端部の面積は 1mm^2 以下の必要がある。

【0011】

【発明の実施の形態】

以下、本発明の実施の形態を、図面をもとに説明する。

【0012】

図1は、本発明の一実施の形態の超音波刻印ペンの側面図を示す。図1中、各部位は次のように構成してある。1

01は振動振幅拡大用のコーン部である。103は振動部で、2個の圧電振動子104を金属ブロック106と107で締結したボルト締めランジュバン型振動子を用いている。102は圧電振動子104に電気入力を与える電気端子である。105はフランジ状突起で、本発明の超音波刻印ペンの長さ振動の節の部分に当たり超音波刻印ペンを固定する役割を有する。

【0013】

本実施の形態では、前記振動部103はボルト締めランジュバン型振動子を用いたが、フェライト系振動子及び圧電素子単体等で振動部を構成することも可能である。また、前記ボルト締めランジュバン型振動子の金属ブロック106と107は機械的品質係数が高く、発熱が少なく、振動振幅を容易に取り出すが可能であるジュラルミン材を使用した。

【0014】

前述の本実施の形態における振動部は、直径が15mm、長さが38mmで共振周波数は63kHzである。同様にコーン部は振幅を拡大させる為、断面がステップ形状で、大断面部直径は15mmで小断面直径は6mmの形状寸法で、約6倍の振動振幅拡大機能を有している。このコーンの材質としては、ニッケルクロム系鋼材のSNC材を使用した。

【0015】

図2は、図1のコーン先端部の拡大図を示す。この先端部には、ダイヤモンド粉末を電着し、ダイヤモンド粉末層の厚みは、およそ100ミクロンである。また、振動先端部の直径dは、0.30mmである。被刻印物が酸化アルミニウム板やステンレス板の場合、ダイヤモンド粉末との硬度差からコーン先端部は磨耗しにくい構造となる。

【0016】

図3は、本実施の形態における超音波刻印ペンを駆動する回路ブロック図である。本回路では、負荷による振動系の共振周波数の変化及びインピーダンスの変化を電流計測ブロックで計測し、発振回路の周波数並びにアンプゲインにフィードバックし、負荷変動に対して、一定の電流が供給されるようにしている。これにより、振動先端部に負荷となる被刻印物が接触した際、振幅を一定に保つことで振動先端部に駆動力が発生し、この駆動力により被刻印物の表面を研削加工することが可能で、回転モータのような特別に強力な加圧力は必要無い。

【0017】

図4には、本発明の超音波刻印ペンの駆動状態のモデル図を示した。本発明の超音波刻印ペンでは、回転モータのような特別に強力な加圧力は必要無いが、被刻印物の表面を研削加工できることは、反作用として、超音波刻印ペンの振動先端部も僅かずつ研磨され、負荷をかけている時間とともに、振動先端部の面の直径が少しずつ変化する。

【0018】

図5には、図4の状態では被刻印物として酸化アルミニウム板を使用し、振動先端部の振動振幅を13ミクロンとした場合で、負荷をかけている時間と振動先端部の直径dの大きさの変化の測定結果を示した。実線Aが本実施の形態を示す。比較例として、コーン材質にステンレスを使用した超音波刻印ペンの測定結果も実線Bとして同時に示した。

【0019】

図5によれば、振動先端部をダイヤモンド粉末電着品とした場合、従来のステンレスと比較すると、連続100時間後の振動部先端の直径が本実施の形態では0.315mm、比較例が0.385mmで、振動先端部の直径dの変化が五分の一以上小さく、磨耗が軽減されている事が分かる。

【0020】

以上、本発明の一実施の形態としてダイヤモンド粉末を電着した振動先端部を有する超音波刻印ペンについて説明したが、コーン材質に炭素鋼の焼き入れ品を用いた場合についても、振動先端部の硬度を大きくすることが可能であり、ダイヤモンド粉末の電着品と同様の効化が得られることは明らかである。

【0021】

【発明の効果】

以上説明したように、本発明によれば、被刻印物の電気伝導性に関係無く、特別の加圧力も必要無く、振動先端部の寸法を長時間一定に保つことが可能となり、高寿命の超音波刻印ペンが提供できる。

【図面の簡単な説明】

【図 1】 本発明の一実施の形態の超音波刻印ペンの側面図。

【図 2】 図 1 のコーン先端部の拡大図。

【図 3】 超音波刻印ペンを駆動する回路ブロック図。

【図 4】 本発明の超音波刻印ペンの駆動状態のモデル図。

【図 5】 振動先端面の直径 d の大きさの変化の測定結果示す図。

【符号の説明】

- 101 コーン部
- 102 電気端子
- 103 振動部
- 104 圧電振動子
- 105 フランジ状突起
- 106, 107 金属ブロック
- 201 ダイヤモンド粉末電着層
- 202 コーン部
- 203 振動先端部

【請求項 1】

圧電振動子単体或いは圧電振動子と変位量拡大コーンを組み合わせた圧電振動複合体を共振周波数近傍で駆動し堅牢物表面に刻印する超音波刻印ペンにおいて、振動先端部の面積が 1 mm^2 以下であることを特徴とする超音波刻印ペン。

【請求項 2】

請求項 1 記載の超音波刻印ペンにおいて、炭素鋼に焼き入れを行った振動先端部を有することを特徴とする超音波刻印ペン。

【請求項 3】

請求項 1 または 2 記載の超音波刻印ペンにおいて、ダイヤモンド粉末の電着を施した振動先端部を有することを特徴とする超音波刻印ペン。

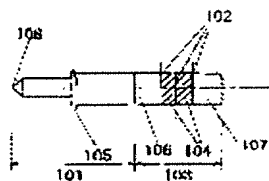
(57) 【要約】

【課題】 刻印時、大きな加圧力を必要とせず、被刻印物の電気伝導性に関係無く、長時間の使用に際しても刻印性能の劣化の少ない超音波刻印ペンを提供すること。

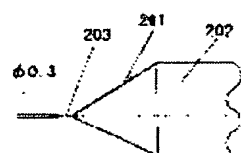
【解決手段】 圧電振動子単体或いは圧電振動子 104 と変位量拡大コーン 101 を組み合わせた圧電振動複合体を共振周波数近傍で駆動し堅牢物表面に刻印する超音波刻印ペンにおいて、振動先端部の面積が 1 mm^2 以下で、ダイヤモンド粉末の電着を施した振動先端部や、炭素鋼に焼き入れを行った振動先端部を有する超音波刻印ペン。

【图 1】

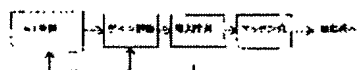
【图 1】



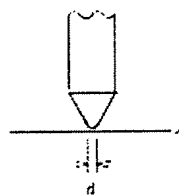
【图 2】



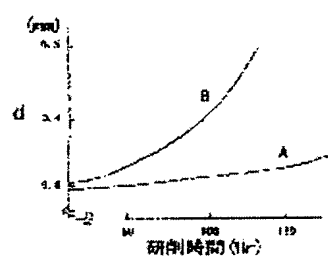
【图 3】



【图 4】



【图 5】



PATENT ABSTRACTS OF JAPAN

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(71)Applicant : NEC TOKIN CORP

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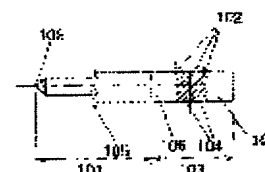
(72)Inventor : SUGAWARA TOSHIYUKI

(54) ULTRASONIC ENGRAVING PEN

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an ultrasonic engraving pen which dispenses with a great pressuring force in engraving, and hardly deteriorates the engraving performance even in a long-time use, regardless of the electric conductivity of an object to be engraved.

SOLUTION: This ultrasonic engraving pen, in which a piezoelectric vibration complex, which is composed of a single piezoelectric vibrator 104 or a combination of the vibrator 104 and a displacement enlarging cone 101, is driven almost at a resonance frequency, so that the engraving can be applied onto the surface of a hard object, is characterized in that the area of a vibrating tip part is set at 1 mm² or less, and the ultrasonic engraving pen is provided with a vibrating tip part where diamond powder is electrodeposited or a vibrating tip part where carbon steel is quenched.



LEGAL STATUS

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20.12.2004

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[Date of final disposal for application]

[Patent number]

[Date of registration]

1/1 DWPX - (C) The Thomson Corp.- image

AN - 2004-320721 [30]

TI - Auto tensioner in motor vehicle, has frictional element comprising synthetic resin composition containing polyphenylene sulfide as main component

DC - A14 A17 A26 A88 Q64

PA - (MIUA) MITSUBOSHI BELTING LTD

PN - JP2004060796 A 20040226 DW2004-30 F16H-007/12 17p *
AP: 2002JP-0221036 20020730

PR - 2002JP-0221036 20020730

IC - F16H-007/12 C09K-003/14

AB - JP2004060796 A

NOVELTY - A frictional element (1) comprising synthetic resin composition containing polyphenylene sulfide as a main component, is provided in the auto tensioner (6).

- USE - For maintaining tension of belt used to drive auxiliary equipment in motor vehicle.
- ADVANTAGE - Enables efficient and stable adjustment of belt tension for a long period of time. Deformation resistance and abrasion resistance are improved.
- DESCRIPTION OF DRAWING(S) - The figure shows a sectional view of the auto tensioner.
- friction element 1
- auto tensioner 6
- fixing element 7
- pulley 8
- axial unit 9
- movable element 10
- coil spring 11(Dwg.4/4)

1/1 DWPX - (C) The Thomson Corp.- image

AN - 2003-011067 [01]

TI - Ultrasonic temperature sensor and apparatus for measurement of ultra high temperature using high resolution signal processing technique

DC - S03 V06

PA - (KOAT-) KOREA ATOMIC ENERGY RES INST

- (KOEL-) KOREA ELECTRIC POWER CORP

IN - HA GS; KANG GH; KANG HY; KIM HD; KIM JT; KIM SB; KOO GM; SIM CM; HAH GS; SHIM CM

NP - 2

NC - 1

PN - KR2002047724 A 20020622 DW2003-01 G01K-011/22 1p *

AP: 2000KR-0076303 20001214

- KR-467985 B 20050124 DW2005-35 G01K-011/22

FD: Previous Publ. KR2002047724

AP: 2000KR-0076303 20001214

PR - 2000KR-0076303 20001214

IC - G01K-011/22

AB - KR2002047724 A

NOVELTY - An ultrasonic temperature sensor comprises a sensing element (20), an electron signal processing terminal (40) and a temperature measuring terminal. The sensing element is coupled to a magnetostrictive element (42) of the electron signal processing terminal through an electron welding. The electron signal processing terminal is electrically coupled to an ultrasonic detector of the temperature measuring terminal, by converting the echo wave echoed from the sensing element into an electrical signal by using start/stop signals of each element.

- DETAILED DESCRIPTION - The sensing element includes a rod (21) made of a tungsten alloy material, and a sheath (22) housing the rod. The electron signal processing terminal has a probe (41) wound with a coil, and the magnetostrictive element, wherein the probe and the magnetostrictive element are arranged to be symmetrical with each other and covered by a case (43).

- ADVANTAGE - An ultrasonic temperature sensor and apparatus is provided to achieve improved quality and optimized real time monitoring, while allowing the ultra high temperature of inner surface of an object to be measured in an accurate manner.(Dwg.1/10)

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- 3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1]

The ultrasonic stamp pen with which area of an oscillating point is characterized by 1mm being two or less in the ultrasonic stamp pen which drives the piezo-electric oscillating complex which combined the piezoelectric transducer simple substance or the piezoelectric transducer, and the amount expansion cone of displacement near the resonance frequency, and is stamped on a strong object front face.

[Claim 2]

The ultrasonic stamp pen characterized by having the oscillating point which quenched at carbon steel in an ultrasonic stamp pen according to claim 1.

[Claim 3]

The ultrasonic stamp pen characterized by having the oscillating point which electrodeposited diamond powder in an ultrasonic stamp pen according to claim 1 or 2.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]

This invention relates to the ultrasonic stamp pen which stamps on strong object front faces, such as a metal, about the stamp pen which forms an alphabetic character and marking especially using supersonic vibration.

[0002]

[Description of the Prior Art]

The electric motor pen on which grinding of the stamped object front face is carried out, and it is stamped by the tip rotating part which was made to carry out high-speed rotation and connected the motor with the revolving shaft as equipment which stamps an alphabetic character and marking on this kind of strong object front face conventionally, the electric pen which uses the discharge phenomenon of the high voltage, is made to carry out melting of the surface of metal, and is stamped are common.

[0003]

In these equipments, in order to perform a deep stamp for a short time, the welding pressure which carries out the pressure welding of the point to a stamped object front face powerfully is required for an electric motor pen. Moreover, discharge becomes unstable and, as for an electric pen, the trouble that a clear stamp is not obtained, and a stamped object are limited to the metaled conductive matter by change of the distance of a nib edge and a stamped object.

[0004]

About the stamp to the strong object front face using the supersonic vibration in a piezoelectric transducer simple substance, the amount of wear for an oscillating point is large, and it is difficult to hold long duration and the same stamp capacity.

[0005]

Moreover, when stamping using the supersonic vibration of a piezoelectric transducer, about 25 microns of amplitudes of an oscillating point are the need from 5 microns. When it is difficult to obtain said amount of amplitudes with a piezoelectric transducer simple substance, the method of expanding the amplitude of an oscillating point is used as piezo-electric oscillating complex which combined the amount expansion fixture of displacement usually called a cone, and the piezoelectric transducer. Under the present circumstances, as an ingredient of said cone, the ingredient of stainless steel with a big elastic modulus or a titanium alloy, and an iron system etc. is usually used.

[0006]

However, if the above-mentioned charge of cone material is not an ingredient which has sufficiently bigger hardness than the hardness of a stamped object, wear of the cone itself becomes large and cannot bear it at use of long duration.

[0007]

[Problem(s) to be Solved by the Invention]

Then, this invention was not made in order to solve the above-mentioned trouble, it does not need big welding pressure at the time of a stamp, but even if there is nothing and it faces use of long duration with regards to the electrical conductivity of a stamped object, it aims at offering an ultrasonic stamp pen with little degradation of the stamp engine performance.

[0008]

[Means for Solving the Problem]

According to this invention, in the ultrasonic stamp pen which drives the piezo-electric oscillating complex which combined the piezoelectric transducer simple substance or the piezoelectric transducer, and the amount expansion cone of displacement near the resonance frequency, and is stamped on a strong object front face, the ultrasonic stamp pen with which area of an oscillating point is characterized by 1mm being two or less is obtained.

[0009]

Moreover, according to this invention, the ultrasonic stamp pen which has the oscillating point which quenched at carbon steel, and the oscillating point which gave electrodeposition of diamond powder is obtained.

[0010]

Since the size of a stamp or the line of marking becomes thicker than 1.2mm and it becomes impossible to display a minute alphabetic character and minute marking when the area of an oscillating point becomes larger than 2 1mm, the area of an oscillating point has 1mm two or less need.

[0011]

[Embodiment of the Invention]

Hereafter, the gestalt of operation of this invention is explained based on a drawing.

[0012]

Drawing 1 shows the side elevation of the ultrasonic stamp pen of the gestalt of 1 operation of this invention. Each part is constituted as follows among drawing 1. 101 is the cone section for amplitude expansion. 103 is the oscillating section and uses the bolting run undergarment mold vibrator which concluded two piezoelectric transducers 104 with the metal blocks 106 and 107. 102 is an electric terminal which gives an electrical input to a piezoelectric transducer 104. 105 is a flange-like projection and has the role which fixes an ultrasonic stamp pen in the part of the knot of die-length vibration of the ultrasonic stamp pen of this invention.

[0013]

It is also possible to constitute the oscillating section from ferrite system vibrator, a piezoelectric-device simple substance, etc. with the gestalt of this operation, although said oscillating section 103 used bolting run undergarment mold vibrator. Moreover, the metal blocks 106 and 107 of said bolting run undergarment mold trembler used possible duralumin material, although the mechanical quality factor was high, and there was little generation of heat and it took out the amplitude easily.

[0014]

As for the oscillating section in the gestalt of this above-mentioned operation, a diameter is [15mm and die length of resonance frequency] 63kHz in 38mm. Similarly, in order for the cone section to make the amplitude expand, it is a step configuration, and a large cross-section section diameter is a 6mm geometry in 15mm, and, as for the small cross-section diameter, the cross section has the amplitude expansion function of being about 6 times many as this. As the quality of the material of this cone, the SNC material of nickel chromium system steel materials was used.

[0015]

Drawing 2 shows the enlarged drawing of the cone point of drawing 1 . Electrodepositing diamond powder in this point, the thickness of a diamond powder layer is about 100 microns. Moreover, the diameter d of an oscillating point is 0.30mm. A hardness difference with diamond powder to a cone point serves as the structure where a stamped object cannot be easily worn out in the case of an aluminum-oxide plate or a stainless plate.

[0016]

Drawing 3 is a circuit block diagram which drives the ultrasonic stamp pen in the gestalt of this operation. In this circuit, change of the resonance frequency of the vibration system by the load and change of an impedance are measured with a current measurement block, it feeds back to the frequency list of an oscillator circuit at an amplifier gain, and the fixed current is made to be supplied to a load effect. it is like [when the stamped object used as a load contacts an oscillating point by this / it is possible for driving force to occur at the tip of oscillating by keeping the amplitude constant, and to carry out the grinding process of the front face of a stamped object with this driving force, and] a rotary motor -- powerful welding pressure does not extraordinarily have the need.

[0017]

The model Fig. of the drive condition of the ultrasonic stamp pen of this invention was shown in drawing 4 . With the ultrasonic stamp pen of this invention, although powerful welding pressure does not extraordinarily have the need, as reaction, the oscillating point of an ultrasonic stamp pen is also ground small [every], and, as for a thing like a rotary motor for which the grinding process of the front face of a stamped object can be carried out, the diameter of the field of an oscillating point changes little by little with the time amount over which the load is covered.

[0018]

The aluminum-oxide plate was used for drawing 5 as a stamped object in the state of drawing 4 , and the time amount and the measurement result of change of the magnitude of the diameter d of an oscillating apical surface over which the load is covered were shown in it by the case where the amplitude of an oscillating point is made into 13 microns. A continuous line A shows the gestalt of this operation. As an example of a comparison, the measurement result of the ultrasonic stamp pen which used stainless steel for the cone quality of the material was also shown in coincidence as a continuous line B.

[0019]

According to drawing 5 , when an oscillating point is used as a diamond powder electrodeposition article, as compared with the conventional stainless steel, 0.315mm and the example of a comparison of half a sum are [change of the diameter d of an oscillating point / one or more] small at 0.385mm, and it turns out with the gestalt of this operation of the diameter at the tip of the oscillating section 100 hours after continuation that wear is mitigated.

[0020]

As mentioned above, although the ultrasonic stamp pen which has the oscillating point which electrodeposited diamond powder as a gestalt of 1 operation of this invention was explained, it is possible to enlarge the degree of hardness of an oscillating point also about the case where the quenching article of carbon steel is used for the cone quality of the material, and it is clear that the same effect-ization as the electrodeposited elegance of diamond powder is obtained.

[0021]

[Effect of the Invention]

According to this invention, as explained above, with regards to the electrical

conductivity of a stamped object, there is nothing and special welding pressure does not have the need, either, it becomes possible to maintain the dimension of an oscillating point at long duration regularity, and the ultrasonic stamp pen of a high life can be offered.

[Brief Description of the Drawings]

[Drawing 1] The side elevation of the ultrasonic stamp pen of the gestalt of 1 operation of this invention.

[Drawing 2] The enlarged drawing of the cone point of drawing 1 .

[Drawing 3] The circuit block diagram which drives an ultrasonic stamp pen.

[Drawing 4] The model Fig. of the drive condition of the ultrasonic stamp pen of this invention.

[Drawing 5] Drawing of change of the magnitude of the diameter d of an oscillating apical surface shown as a result of measurement.

[Description of Notations]

101 Cone Section

102 Electric Terminal

103 Oscillating Section

104 Piezoelectric Transducer

105 Flange-like Projection

106,107 Metal block

201 Diamond Powder Electrodeposition Layer

202 Cone Section

203 Oscillating Point

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention]

This invention relates to the ultrasonic stamp pen which stamps on strong object front faces, such as a metal, about the stamp pen which forms an alphabetic character and marking especially using supersonic vibration.

[0002]

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PRIOR ART

[Description of the Prior Art]

The electric motor pen on which grinding of the stamped object front face is carried out, and it is stamped by the tip rotating part which was made to carry out high-speed rotation and connected the motor with the revolving shaft as equipment which stamps an alphabetic character and marking on this kind of strong object front face conventionally, the electric pen which uses the discharge phenomenon of the high voltage, is made to carry out melting of the surface of metal, and is stamped are common.

[0003]

In these equipments, in order to perform a deep stamp for a short time, the welding pressure which carries out the pressure welding of the point to a stamped object front face powerfully is required for an electric motor pen. Moreover, discharge becomes unstable and, as for an electric pen, the trouble that a clear stamp is not obtained, and a stamped object are limited to the metaled conductive matter by change of the distance of a nib edge and a stamped object.

[0004]

About the stamp to the strong object front face using the supersonic vibration in a piezoelectric transducer simple substance, the amount of wear for an oscillating point is large, and it is difficult to hold long duration and the same stamp capacity.

[0005]

Moreover, when stamping using the supersonic vibration of a piezoelectric transducer, about 25 microns of amplitudes of an oscillating point are the need from 5 microns. When it is difficult to obtain said amount of amplitudes with a piezoelectric transducer simple substance, the method of expanding the amplitude of an oscillating point is used as piezo-electric oscillating complex which combined the amount expansion fixture of displacement usually called a cone, and the piezoelectric transducer. Under the present circumstances, as an ingredient of said cone, the ingredient of stainless steel with a big elastic modulus or a titanium alloy, and an iron system etc. is usually used.

[0006]

However, if the above-mentioned charge of cone material is not an ingredient which has sufficiently bigger hardness than the hardness of a stamped object, wear of the cone itself becomes large and cannot bear it at use of long duration.

[0007]

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EFFECT OF THE INVENTION

[Effect of the Invention]

According to this invention, as explained above, with regards to the electrical conductivity of a stamped object, there is nothing and special welding pressure does not have the need, either, it becomes possible to maintain the dimension of an oscillating point at long duration regularity, and the ultrasonic stamp pen of a high life can be offered.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]

Then, this invention was not made in order to solve the above-mentioned trouble, it does not need big welding pressure at the time of a stamp, but even if there is nothing and it faces use of long duration with regards to the electrical conductivity of a stamped object, it aims at offering an ultrasonic stamp pen with little degradation of the stamp engine performance.

[0008]

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MEANS

[Means for Solving the Problem]

According to this invention, in the ultrasonic stamp pen which drives the piezo-electric oscillating complex which combined the piezoelectric transducer simple substance or the piezoelectric transducer, and the amount expansion cone of displacement near the resonance frequency, and is stamped on a strong object front face, the ultrasonic stamp pen with which area of an oscillating point is characterized by 1mm being two or less is obtained.

[0009]

Moreover, according to this invention, the ultrasonic stamp pen which has the oscillating point which quenched at carbon steel, and the oscillating point which gave electrodeposition of diamond powder is obtained.

[0010]

Since the size of a stamp or the line of marking becomes thicker than 1.2mm and it becomes impossible to display a minute alphabetic character and minute marking when the area of an oscillating point becomes larger than 2 1mm, the area of an oscillating point has 1mm two or less need.

[0011]

[Embodiment of the Invention]

Hereafter, the gestalt of operation of this invention is explained based on a drawing.

[0012]

Drawing 1 shows the side elevation of the ultrasonic stamp pen of the gestalt of 1 operation of this invention. Each part is constituted as follows among drawing 1 . 101 is the cone section for amplitude expansion. 103 is the oscillating section and uses the bolting run undergarment mold vibrator which concluded two piezoelectric transducers 104 with the metal blocks 106 and 107. 102 is an electric terminal which gives an electrical input to a piezoelectric transducer 104. 105 is a flange-like projection and has the role which fixes an ultrasonic stamp pen in the part of the knot of die-length vibration of the ultrasonic stamp pen of this invention.

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[Translation done.]

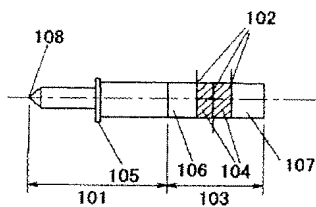
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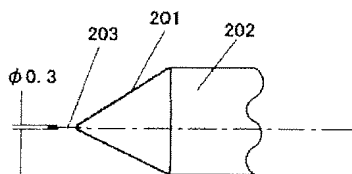
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DRAWINGS

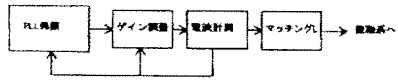
[Drawing 1]



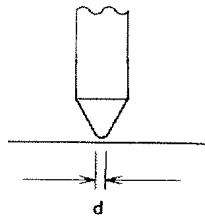
[Drawing 2]



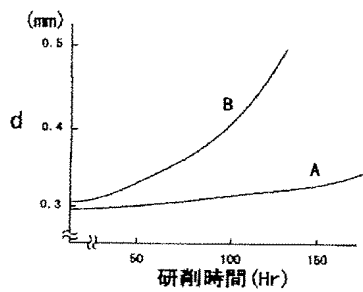
[Drawing 3]



[Drawing 4]



[Drawing 5]



[Translation done.]